

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

Claims 12-15, 18, and 22 have been amended. Support for the amendments is provided, for example, in Fig. 8 and paragraphs [0093] and [0095] of Applicants' published specification. The amendments were not presented earlier due to the unforeseeability of the remarks presented in the Final Rejection. (It should be noted that references herein to the specification and drawings are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments.)

Claims 12-15, 17, 18, 21, and 22 were rejected, under 35 USC §103(a), as being unpatentable over Perrett et al. (US 6,018,275) in view of Johansson et al. (*Linearization of Multi-Carrier Power Amplifiers*, Vehicular Technology Conference, 1993 IEEE 43rd, 18-20 May 1993, pages 684-687). To the extent that these rejections may be deemed applicable to the amended claims, the Applicants respectfully traverse in accordance with the points set forth below.

Claim 12 now defines a modulation apparatus having a compensator that determines a phase distortion. The phase distortion is determined by multiplying a constant by a magnitude of a phase change between adjacent data obtained from a subsequent baseband phase signal that follows a first baseband phase signal. The magnitude of this subsequent baseband phase signal may be expressed, for ease of reference, as $|\Delta\theta_0|$. The constant (expressed herein as C) is obtained by dividing a difference between a first baseband phase signal (expressed herein as S_1) and a second baseband signal (expressed herein as S_2) by either: (1) a magnitude of a frequency

change per unit time of the first baseband signal (expressed herein as $|\Delta f_1|$) or (2) a magnitude of a phase change per unit time of the first baseband signal (expressed herein as $|\Delta \theta_1|$). Thus, the constant may be expressed by the equations:

$$C = \frac{S_1 - S_2}{|\Delta f_1|} \text{ or } C = \frac{S_1 - S_2}{|\Delta \theta_1|}.$$

And the phase distortion (expressed herein as D_1) determined by the claimed compensator may be expressed as:

$$D_1 = \frac{|\Delta \theta_0| \cdot (S_1 - S_2)}{|\Delta f_1|} \text{ or } D_1 = \frac{|\Delta \theta_0| \cdot (S_1 - S_2)}{|\Delta \theta_1|}.$$

The Final Rejection noted that Applicants' previous version of claim 12 appeared to recite determining a phase distortion (expressed herein as D_0) using the expression:

$$D_0 = \frac{|\Delta \theta_1| \cdot (S_1 - S_2)}{|\Delta \theta_1|}, \text{ in which the value } |\Delta \theta_1| \text{ in the numerator and the denominator}$$

would cancel out so as to simplify the equation to: $D_0 = (S_1 - S_2)$ (see Final Rejection page 5, line 15, through page 6, line 1).

Applicants submit that the magnitude values, as now recited in claim 12, and expressed above in the equations for D_1 are not identical values that cancel within the numerator and denominator of the equations for D_1 .

Although the Final Rejection proposes that Johansson discloses a compensator that determines a phase distortion by subtracting one signal from another, such as is expressed by the equation: $D_0 = (S_1 - S_2)$ (see Final Rejection page 6, lines 1-2), the Final Rejection does not propose that Johansson discloses multiplying the difference of two signals ($S_1 - S_2$) by a phase magnitude $|\Delta \theta_0|$ and dividing this difference by a different phase magnitude $|\Delta \theta_1|$, as is now

achieved by the subject matter of claim 12. The Final Rejection acknowledges that Perrett does not supplement the teachings of Johansson in this regard (see page 5, lines 1-6). This distinguishing subject matter of claim 12 is more broadly described below.

Claim 12 now defines a modulation apparatus that: (1) determines a second phase distortion by multiplying a magnitude of a phase change between adjacent data, obtained from a subsequent first baseband phase signal that follows a first baseband phase signal, by a constant; (2) compensates the subsequent first baseband phase signal using the determined second phase distortion; and (3) outputs the compensated first baseband phase signal. The constant is determined by dividing a third phase distortion by one of a magnitude of a frequency change per unit time of the first baseband phase signal and a magnitude of a phase change between adjacent data of the first baseband phase signal. The third phase distortion is a difference between the first baseband phase signal and the second baseband phase signal. The claimed subject matter provides an advantage of accurate phase distortion compensation (see paragraph [0094] of Applicants' published specification).

In summary, the features of claim 12 include: (1) determining a constant using one of a magnitude of a frequency change and a magnitude of a phase change, each magnitude being obtained from a first baseband phase signal, (2) storing the determined constant, and, afterward, (3) compensating a subsequent first baseband phase signal that is transmitted successively, using the stored constant.

The Final Rejection acknowledges that Perrett does not disclose Applicants' claimed demodulator and compensator (see Final Rejection page 3, lines 4-13), but proposes that Johansson does (see page 5, lines 1-4).

However, Johansson only discloses a general idea of closed loop distortion compensation (see Johansson page 686, left column, and page 684) and provides no specific disclosure as to what calculation is performed using what values to perform distortion compensation. Claim 12 distinguishes over Johansson's disclosure in that claim 12 recites: (1) determining a constant using one of a magnitude of a frequency change and a magnitude of a phase change, each magnitude being obtained from a first baseband phase signal, (2) storing the determined constant, and, afterward, (3) compensating a subsequent first baseband phase signal that is transmitted successively, using the stored constant. That is, Johansson does not disclose the Applicants' claimed compensator. Perrett is not cited in the Final Rejection for supplementing the teachings of Johansson in this regard.

Accordingly, the Applicants submit that the teachings of Perrett and Johansson, even if combined as proposed in the Final Rejection, still would lack the above-noted features of claim 12 and thus these references, considered individually or in combination, do not render obvious the subject matter now defined by claim 12. Independent claim 22 now similarly recites the above-mentioned subject matter distinguishing apparatus claim 12 from the applied references, but does so with respect to a method. Therefore, allowance of claims 12 and 22 is considered to be warranted. The dependent claim are considered to be allowable due to their dependence from an allowable base claim and also due to their recitation of subject matter that provides an independent basis for their individual allowability.

In view of the above, it is submitted that this application is in condition for allowance and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

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